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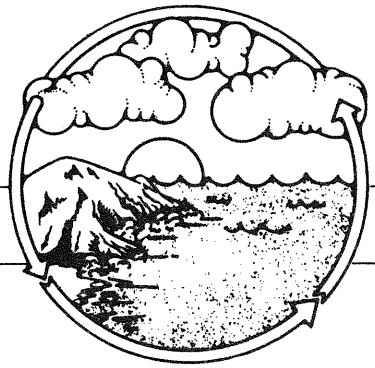
PACLIM



Climate Variability
of the
Eastern North Pacific
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Views and conclusions contained in this publication do not necessarily reflect the opinions of the Interagency Program or its member agencies.

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Appendixes

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The PACLIM meetings are also kept alive by financial contributions from our sponsors, listed elsewhere in this proceedings. Your support is accepted with gratitude. Our goal of obtaining and sharing a better understanding of how our home the Earth functions, and making use of the resulting knowledge is substantially impaired without such assistance.

At the risk of sounding like a broken record, the process of producing a proceedings volume is greatly expedited if at least one of the participants knows what they are doing. Our technical editor, Vera Tharp, has been a pleasure to work with, and is in great measure responsible for the readable quality of the resulting product. She is invariably cheerful and helpful, and her experience and technical competence make my role much easier to accomplish. From all of us, thank you very much, Vera!

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STATEMENT OF PURPOSE
Pacific Climate (PACLIM) Workshops

In 1984, a workshop was held on "Climatic Variability of the Eastern North Pacific and Western North America". From it has emerged an annual series of workshops held at the Asilomar Conference Center, Monterey Peninsula, California. These annual meetings, which involve 80-100 participants, have come to be known as PACLIM (Pacific Climate) Workshops, reflecting broad interests in the climatologies associated with the Pacific Ocean. Participants have included atmospheric scientists, hydrologists, glaciologists, oceanographers, limnologists, and both marine and terrestrial biologists. A major collective goal of PACLIM is to connect their various interests with a common target.

PACLIM arose from broad concern about the impact of possible climate change over the next century. From observed changes in the historical record, it is certain that climate change will have tremendous societal impacts through coincident effects on global ecology, hydrology, geology, and oceanography. It is increasingly clear that our ability to predict climate change is best derived from an understanding of global processes. Human impacts are primarily terrestrial in nature, but the major forcing processes are atmospheric and oceanic in origin and transferred through geologic and biologic conditions. Our understanding of the global climate system and its relationship to ecosystems will arise from a regional study of its components in the Pacific Ocean and the western Americas, where ocean/atmosphere coupling is strongly expressed. With such diverse meteorologic phenomena as the El Niño-Southern Oscillation and shifts in the Aleutian Low and North Pacific High, the Eastern Pacific is a region that has tremendous global influences, and strong effects on North America in particular. This region is rich in climatic records, both instrumental and proxy. Recent research efforts are beginning to focus on better paleoclimatic reconstructions that will put present day climatic variability in context and should allow better anticipation of future changes.

The PACLIM workshops have addressed the problem of defining regional coupling of multifold elements, as organized by phenomena that are global in extent. Because climate expresses itself through the natural system, our activity has been, from the beginning, multidisciplinary in scope and is evolving into a truly interdisciplinary cooperative effort. The specialized knowledge from different disciplines has brought together these characteristic climatic records and process measurements to provide a synthesis of understanding of the complete system.

Our interdisciplinary group uses diverse time series, measured both directly and through proxy indicators, to study past climatic conditions and current processes in this region. Characterizing and linking the geosphere, biosphere, and hydrosphere in this region will provide a scientific analogue and, hence, a basis for understanding similar linkages in other regions, as well as for anticipating the response to future climate variations. Our emphasis in PACLIM is to study the interrelationships among diverse data. The resultant information obtained will be complementary and lead to better synthesis of biological and geophysical variability in the region. By necessity, in order to understand these interactive phenomena, we will incorporate studies that consider a broad range of topics and multiple time scales, from months to millennia.

The benefit of the effort to understand the regulation of ecosystems and their variability is clear. It is critical now, from both a management and scientific point of view, that we develop a more complete understanding of how climatic change affects the structure and function of these systems. The PACLIM venue covers an extraordinary range of ecosystem types and richness. There is empirical evidence that large-scale climatic fluctuations force large-scale ecosystem response in the California current and in a very different system, the North Pacific central gyre. The implications of these observations are highly significant and indicate the need for aggressive pursuit of multidisciplinary studies.

Water supplies in the western Americas exhibit fluctuations over a continuum of scales, with considerable social and economic impact, especially in the Southwest, where demand exceeds supply. The spatial extent and variability of the hydrologic system, such as precipitation deficits and drought, are strongly coupled to climate. For instance, in the western United States where rainfall is primarily a cool-season phenomenon, year-to-year changes in the activity and tracking of North Pacific winter storms have substantial influence on the hydrological balance. In turn, this atmospheric variability is at least weakly coupled to anomalous thermal conditions in the upper ocean. Thus, a primary objective of PACLIM is to better understand the linkage between large-scale atmospheric and hydrologic variabilities, with their complex effects on chemical and biological systems.

Proceedings of the first PACLIM workshops were published as
AGU Geophysical Monograph 55 (Peterson, ed., 1989).
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